Mathematics Compulsory Part

PAPER 2

for HKDSE

Time allowed: 1 hour 15 minutes

1. Read carefully the instructions on the Answer Sheet. Stick a barcode label and insert the information required in the spaces provided.
2. When told to open this book, you should check that all the questions are there. Look for the words '**END OF PAPER**' after the last question.
3. There are 30 questions in Section A and 15 questions in Section B. The diagrams in this paper are not necessarily drawn to scale. Choose the best answer for each question.
4. All questions carry equal marks.
5. **ANSWER ALL QUESTIONS.** You should use an HB pencil to mark all your answers on the Answer Sheet. Wrong marks must be completely erased with a clean rubber.
6. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.
7. No marks will be deducted for wrong answers.

Not to be taken away before the end of the examination session

Section B

31. The H.C.F. of $x^4 - x^2$, $x^3 + 3x^2 + 2x$ and $x^2y + x^3y$ is
    A. x.
    B. $x(1+x)$.
    C. $x^2(1+x)$.
    D. $x^2y(1+x)(x-1)(x+2)$.

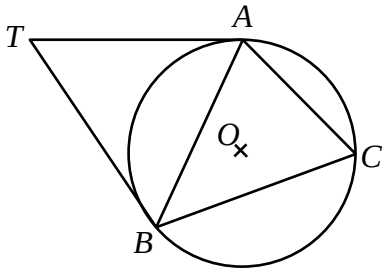
32. Which of the following is the smallest?
    A. 0.538^{77127}
    B. 0.654^{86834}
    C. 0.765^{98100}
    D. 0.823^{115392}

33. If $\begin{cases} 3^y = \log_7 x + 2 \\ 3^{2y} + \log_7 x = 10 \end{cases}$, then $x + y =$
    A. 1.
    B. 2.
    C. 7.
    D. 8.

34. $3 \times 16^2 + 2 \times 4^2 + 1 \times 2^2 =$
    A. 100100100_2.
    B. 110100100_2.
    C. 1100100100_2.
    D. 1110100100_2.

35. If $\frac{1}{h} = h - 2$ and $k = \frac{k^2 - 1}{2}$, where h and k are two distinct non-zero real numbers, then $(h-2)(k-2) =$
    A. –9.
    B. –1.
    C. 7.
    D. 9.

40. In the figure, O is the centre of the circle ABC as well as the in-centre of the triangle ABC. TA and TB are tangents to the circle at A and B respectively. Find $\angle ATB + \angle ACB$.



A. $120°$.

B. $135°$.

C. $140°$.

D. $150°$.

41. If the volume of a regular tetrahedron is $\sqrt{3}\ \text{cm}^3$, then the total surface area of the tetrahedron is

A. $\frac{4}{3}\ \text{cm}^2$.

B. $\frac{8}{3}\ \text{cm}^2$.

C. $\frac{4\sqrt{3}}{3}\ \text{cm}^2$.

D. $6\sqrt{3}\ \text{cm}^2$.

42. Find the range of values of k such that the circle $x^2 + y^2 - 10x - 24y + k = 0$ and the straight line $5x - 12y - 50 = 0$ do not intersect.

A. $k > 0$

B. $k < 0$

C. $k > \frac{4225}{24}$

D. $k < \frac{4225}{24}$

43. A club consists of 6 boys and 14 girls. If a team of 6 students is selected from the club and the team consists of at least two boys, how many different teams can be formed?

A. 23745

B. 35757

C. 360360

D. 720720

44. Bag A contains 2 red balls, 2 green balls and 2 blue balls while bag B contains 3 red balls and 5 blue balls. If a bag is randomly chosen and then a ball is randomly drawn from the bag, find the probability that a red ball is drawn.

A. $\frac{1}{15}$

B. $\frac{17}{48}$

C. $\frac{31}{48}$

D. $\frac{14}{15}$

45. Let u_n be an arithmetic sequence. Consider the two data sets $A\{u_1, u_2, u_3, \cdots, u_{99}, u_{100}\}$ and $B\{u_{51}, u_{52}, u_{53}, \cdots, u_{149}, u_{150}\}$. Which of the following is/are true?

I. Mean of A = Mean of B

II. Range of A = Range of B

III. Variance of A = Variance of B

A. I only

B. II only

C. I and III only

D. II and III only

END OF PAPER